

**PART 1      GENERAL**

**1.1      SECTION INCLUDES**

- .1      Materials and installation of polymeric geotextiles used in revetments, breakwaters, retaining wall structures, filtration, drainage structures, roadbeds and railroad beds purpose of which is to:
  - .1      Separate and prevent mixing of granular materials of different grading.
  - .2      Act as hydraulic filters permitting passage of water while retaining soil strength of granular structure.

**1.2      RELATED SECTIONS**

- .1      Section 01 33 00 - Submittal Procedures.
- .2      Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
- .3      Section 31 23 25 – Rock and Gravel Fill
- .4      Section 31 53 13 – Timber Cribwork

**1.3      MEASUREMENT PROCEDURES**

- .1      Measure geotextiles in square metres of surface covered by material. No allowance will be made for seams and overlaps.

**1.4      REFERENCES**

- .1      Codes and Standards referenced in this section refer to the latest edition thereof.
- .2      American Society for Testing and Materials International, (ASTM)
  - .1      ASTM D4491, Standard Test Methods for Water Permeability of Geotextiles by Permittivity.
  - .2      ASTM D4595-05, Standard Test Method for Tensile Properties of Geotextiles by the Wide-Width Strip Method.
  - .3      ASTM D4716, Test Method for Determining the (In-Plane) Flow Rate Per Unit Width and Hydraulic Transmissivity of a Geosynthetic Using a Constant Head.
  - .4      ASTM D4751, Standard Test Method for Determining Apparent Opening Size of a Geotextile.
- .3      Canadian General Standards Board (CGSB)
  - .1      CAN/CGSB-4.2 No. 11.2, Textile Test Methods - Bursting Strength - Ball Burst Test.
  - .2      CAN/CGSB-148.1, Methods of Testing Geotextiles and Complete Geomembranes.
    - .1      No.2-M85, Methods of Testing Geosynthetics - Mass per Unit Area.
    - .2      No.3-M85, Methods of Testing Geosynthetics - Thickness of Geotextiles.

- .3 No.6.1-93, Methods of Testing Geotextiles and Geomembranes - Bursting Strength of Geotextiles Under No Compressive Load.
- .4 No.7.3-92, Methods of Testing Geotextiles and Geomembranes - Grab Tensile Test for Geotextiles.
- .5 No. 10-94, Methods of Testing Geosynthetics - Geotextiles - Filtration Opening Size.
- .4 Canadian Standards Association (CSA International)
  - .1 CAN/CSA-G40.20/G40.21, General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.
  - .2 CAN/CSA-G164, Hot Dip Galvanizing of Irregularly Shaped Articles.

## **1.5 SUBMITTALS**

- .1 Submit samples in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit to Departmental Representative following samples at least 2 weeks prior to beginning Work.
  - .1 Minimum length of 1 m of roll width of geotextile.
- .3 Submit to Departmental Representative one copy of mill test data and certificate at least 2 weeks prior to start of Work.

## **1.6 DELIVERY, STORAGE AND HANDLING**

- .1 During delivery and storage, protect geotextiles from direct sunlight, ultraviolet rays, excessive heat, mud, dirt, dust, debris and rodents.

## **1.7 WASTE MANAGEMENT AND DISPOSAL**

- .1 Separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management And Disposal.
- .2 Remove from site and dispose of all packaging materials at appropriate recycling facilities.
- .3 Collect and separate for disposal paper, plastic, polystyrene, corrugated cardboard, packaging material in appropriate on-site bins for recycling in accordance with Waste Management Plan.
- .4 Fold up metal banding, flatten and place in designated area for recycling.

## **PART 2 PRODUCTS**

### **2.1 MATERIAL**

- .1 Geotextile: woven or non-woven synthetic fibre fabric, supplied in rolls.
  - .1 Width: 3.5 m minimum.
  - .2 Length: 50 m minimum.

- .3 Composed of: minimum 85% by mass of polyester with inhibitors added to base plastic to resist deterioration by ultra-violet and heat exposure.
- .2 Physical properties:
  - .1 Thickness: to CAN/CGSB-148.1, No.3, minimum 2.5 mm.
  - .2 Mass per unit area: to CAN/CGSB-148.1, No.2, minimum 400 g/m<sup>2</sup>.
  - .3 Tensile strength and elongation (in any principal direction): to ASTM D4595.
    - .1 Tensile strength: minimum 1200 N, wet condition.
    - .2 Elongation at break: minimum 50 to 100 percent.
    - .3 Seam strength: equal to or greater than tensile strength of fabric.
    - .4 Mullen burst strength: to CAN/CGSB-4.2, method 11.1, minimum 3100 kPa.
- .3 Hydraulic properties:
  - .1 Apparent opening size (AOS): to ASTM D4751, 50 to 100 micrometres.
  - .2 Permittivity: to ASTM D4491, 0.25 cm per second.
- .4 Securing pins and washers: to CAN/CSA-G40.21, Grade 300W, hot-dipped galvanized with minimum zinc coating of 600 g/m<sup>2</sup> to CAN/CSA G164.

## **PART 3**      **EXECUTION**

### **3.1**      **INSTALLATION**

- .1 Place one (1) layer of geotextile material from base elevation of crib to top of crib or as detailed on the drawings and retain in position with securing pins and washers. Contractor shall protect geotextile at all times and replace any damaged or torn sections due to placement of rock fill.
- .2 Place geotextile material by unrolling onto graded surface in orientation, manner and locations indicated and retain in position with securing pins and washers.
- .3 Place geotextile material smooth and free of tension stress, folds, wrinkles and creases.
- .4 Place geotextile material on sloping surfaces in one continuous length from toe of slope to upper extent of geotextile.
- .5 Overlap each successive strip of geotextile 600 mm over previously laid strip.
- .6 Pin successive strips of geotextile with securing pins at 300 mm interval at mid-point of lap as indicated.
- .7 Protect installed geotextile material from displacement, damage or deterioration before, during and after placement of material layers.
- .8 After installation, cover with overlying layer within 4 hours of placement.
- .9 Replace damaged or deteriorated geotextile to approval of Departmental Representative.

- .10 Place and compact soil layers in accordance with Section 31 23 25 – Rock and Gravel Fill.

**3.2 CLEANING**

- .1 Remove construction debris from Project site and dispose of debris in an environmentally responsible and legal manner.

**3.3 PROTECTION**

- .1 Vehicular traffic not permitted directly on geotextile.

**END OF SECTION**